FOREST SURVEY RELEASE* No. 11 April 11, 1935.

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SOUTHERN FOREST EXPERIMENT STATION

E. L. Demmon, Director

New Orleans, La.

PULPING AND NONPULPING CORDWOOD VOLUME

IN SURVEY UNIT #2

MISSISSIPPI

By

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* - This is an advance release of Forest Survey data that will be included in complete reports to be published later. This information is subject to correction or amplification as computations proceed.

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PULPING AND NONPULPING CORDWOOD VOLUME

IN SURVEY UNIT #2, MISSISSIPPI

This report presents advance information on the supply of cordwood in both pulping and nonpulping tree species in an area of approximately 8,153,500 acres in northern Mississippi. As shown in Fig. 1, this area covers the major portion of twenty-seven counties lying east of the bluffs that rim the delta of the Mississippi River. The general topography is that of a rolling, well-drained upland, with an average elevation above sea level of 300 to 800 feet; the highest levels and roughest topography occur in the northeast. The Unit is drained by the following rivers: In the northeast, the Tennessee; in the east, the Tombigbee; and in the central and western part, the Cold Water, Tallahatchie, Yocona, Yalobusha, and Big Black, tributaries of the Yazoo which flows into the Mississippi.

All or part of DeSoto, Benton, Marshall, Tate, Panola, Lafayette, and Yalobusha counties are included in a subregion differing somewhat from the rest of the area (see Fig. 2). This subregion is distinguished by the presence of an upland hardwood type, characterized by hickory and mixed oaks. Along the western side of the Tombigbee River lies another distinctive subregion---the northwestern extremity of the Alabama Black Belt, a prairie-like country of limestone soils, now largely under farm cultivation. With the exception of these Tombigbee black lands, where wooded areas are scarce, forests and farms are scattered more or less uniformly over the entire Unit; the largest areas of contiguous forest land are to be found in the northeast.

The region is well served with railroads, among which may be mentioned the Illinois Central; Gulf, Mobile, and Northern; Mobile and Ohio; Columbus and Greenville; and the Frisco Lines. Less than 5 percent of the total land area is more than 5 miles distant from these railroads or from state and county highways, nearly all of which are graded and many of which are surfaced with gravel.

The estimates of cordwood volume given here are classified by pulping and nonpulping species. They are based on data gathered from February 1932 through April 1933 by the Forest Survey, a part of the U.S. Forest Service and an activity of the Southern Forest Experiment Station. Specially trained timber estimators, who surveyed the entire Unit along parallel compass lines, made the inventory by systematically measuring the timber and recording the forest and land-use conditions on 10,526 one-quarter acre sample plots.

All data given in this release are preliminary and subject to correction and modification when final computations have been completed; but changes in the estimates of volume are not likely to be extensive or important. At this time no statement concerning the availability of present pulpwood supplies can be made with confidence. Such availability figures can only be set forth after data on timber growth, industrial use, and economic aspects of forest products industries have been interpreted; for continuous industrial use of forest products must be based upon the conception of the forest as a self-perpetuating crop, rather than an exhaustible mine. These survey data covering the character and economic aspects, as well as the quantity, growth, and drain of the forest crop are now being summarized and interpreted. When this interpretive work is complete, the Forest Survey plans to publish a comprehensive, detailed report for the Unit, which will cover not only pulpwood but all other forest products.

Land Area

In the distribution of area by class of land use, shown in Table 1, slightly less than 38 percent of the total land area is classified as forest land, whereas more than 60 percent is agricultural.

Table 1. - Distribution of area by class of land use

Land use classes	Area in acres		Percent of total area
Forest		3,089,100	37.9
Agricultural:			
In cultivation:			
Old cropland [1]	2,636,000		32.3
New cropland [2]	110,000		1.4
Out of cultivation:			
Idle [3]	318,400		3.9
Abandoned [4]	775,400		9.5
Pasture:			
Improved [5]	697,100		8.6
Woodland [6]	369,500		4.5
Total agricultural		4,906,400	60.2
Other:			
Waterways	34,100		.4
Towns and villages	31,000		.4
Roads, railroads, etc.	92,900		1.1
Total other		158,000	1.9
Total area		8,153,500	100.0

[1] Land cultivated at least five years and on which a farm crop was raised within two years prior to the date of survey.

[2] Land recently converted from forest to cropland.

[3] Cultivated land which has been idle for two years or more but which has not reached the abandoned stage.

[4] Land once cultivated but showing distinct evidence of having been abandoned for agricultural crop production; no attempt has been made to maintain it as improved pasture.

[5] Cleared land under fence, used primarly for grazing, where a real attempt has been made to produce and maintain a sod.

[6] More or less wooded areas used primarily for grazing, and fenced or blocked in such a way that grazing of any kind is confined to the area. Usually no attempt has been made to improve the sod.

Forest Area

In Table 2 the forest area of 3,089,100 acres is classified by forest conditions and forest type groups. The forest conditions are divided into old-growth, defined as original, mature stands; and second-growth, which is young stands developed as a result of forest cutting and other causes. Each of these conditions is further classified as follows:

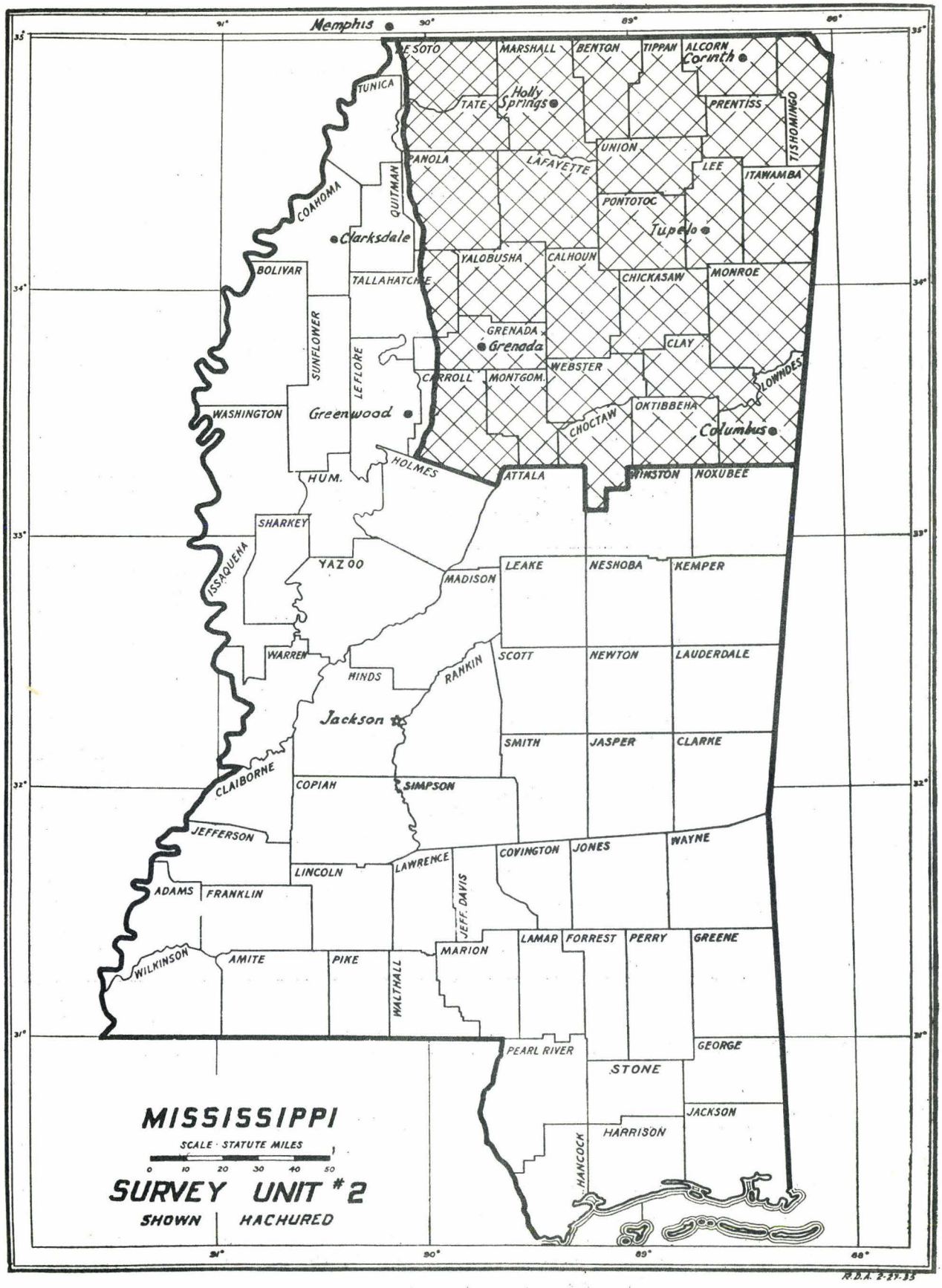

Figure 1. Map showing geographical location of the Unit.

Uncut: Stands in which there has been no cutting, or in which only an occasional tree has been cut for some special purpose.

Culled: Stands from which a portion of the high-grade trees has been removed, generally for a special purpose; but in which enough trees of saw-log size in one or more of the valuable species are left to justify another lumbering operation.

Cut-over: Stands from which practically all trees of merchantable size and quality have been removed, and in which too few are left to justify another lumbering operation at present.

Second-growth stands occupy more than 96 percent of the total forest area, and almost two thirds of this area is classified as uncut. Many of these uncut second-growth stands are not of merchantable saw-timber size at present. The noticeable lack of old-growth stands in this Unit (less than 4 percent) is evidence of the thoroughness with which the forests have been exploited for lumber.

Table 2. - Forest area by forest conditions and forest type groups

Forest conditions	Forest type groups classified by predominant species			Total all types	Percent of total forest area
	Pine	Pine-hardwood	Hardwood		
	Acres				
Old-growth:					
Uncut	-	800	7,700	8,500	.3
Culled	1,500	7,000	17,800	26,300	.8
Cut-over	2,300	16,200	61,300	79,800	2.6
Total old-growth	3,800	24,000	86,800	114,600	3.7
Second-growth:					
Uncut	501,100	426,100	974,500	1,901,700	61.6
Culled	55,000	73,600	38,700	167,300	5.4
Cut-over	173,600	435,300	296,600	905,500	29.3
Total second-growth	729,700	935,000	1,309,800	2,974,500	96.3
Total all conditions	733,500	959,000	1,396,600	3,089,100	
Percent of total forest area	23.8	31.0	45.2		100.0

Under the system of sampling used in the collection of survey data, items which are of infrequent occurrence, and relatively small in quantity, cannot be determined with as high a degree of accuracy as is obtainable for items which occur more frequently, and in substantially greater quantities. Therefore, small tabular figures are to be taken as showing, not the exact magnitudes of the items involved, but their relative magnitudes in comparison with those of other items.

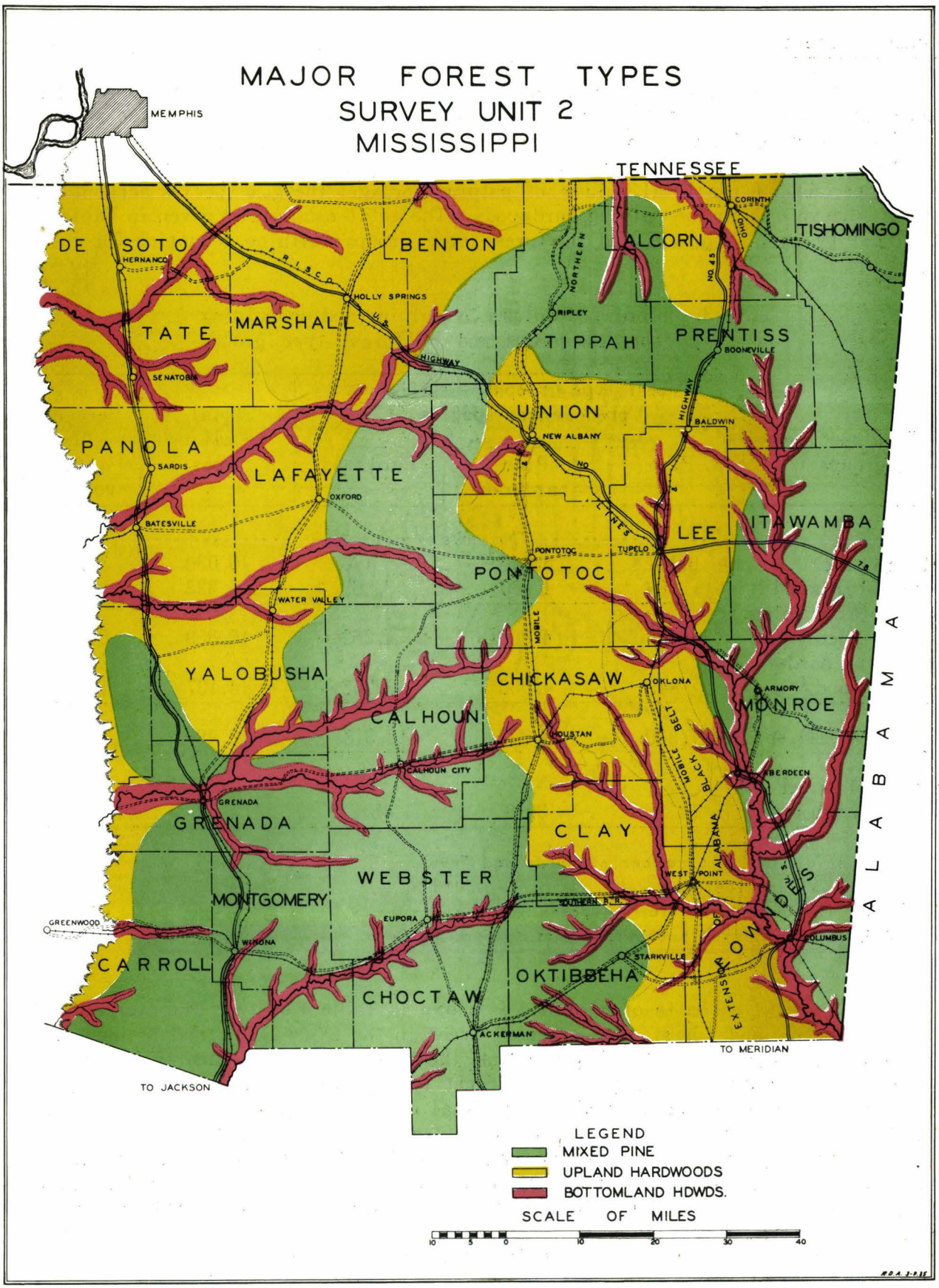

Figure 2. Map showing geographical distribution of forest types.

Volume Estimate

Only live timber was considered in estimating the volume of cordwood. The volume of all sound trees five inches and over in diameter at breast height was included; the stemwood less than four inches in diameter outside of bark, and the limbwood were not included. The pulping pine species, shortleaf and loblolly, make up over 65 percent of the total volume of pulping cordage; the gum species account for most of the volume in the pulping hardwoods. The total estimate is given in Table 3, classified by species groups and by forest type groups, with no deduction for cull.

Table 3. - Cordwood volume by pulping and nonpulping species groups and by forest type groups

Tree species groups	Forest type groups classified by predominant species			Total all types	Percent of total volume
	Pine	Pine-hardwood	Hardwood		
	Thousands of cords [1]				
Pulping pine [2]	6,191	3,646	193	10,030	34.0
Pulping hardwood [3]	294	1,160	3,869	5,323	18.1
Total pulping species	6,485	4,806	4,062	15,353	52.1
Nonpulping hardwood [4]	845	4,036	9,256	14,137	47.9
Total all species	7,330	8,842	13,318	29,490	
Percent of total volume	24.8	30.0	45.2		100.0

[1] To convert to full number of cords add "000".
[2] Shortleaf and loblolly.
[3] Gum, cottonwood, willow, cypress, tupelo, maple.
[4] Oak, hickory, ash, hackberry, elm, pecan, etc.

The total estimate of cordwood is shown in Table 4 by tree diameter classes in species groups and forest type groups. Trees in the 6-, 8-, 10-, and 12-inch diameter classes comprise nearly 72 percent of the pine cordage and nearly 58 percent of the pulping hardwood cordage in all forest type groups. Combining both pulping and nonpulping species, 28 percent of the total cordage is in trees of the 6- and 8-inch diameter classes, and 38 percent is in trees of the 10- and 12-inch classes. Thrifty of growth, trees of these sizes form the nucleus from which future saw-timber crops must develop; and periodical thinnings of these young stands can furnish a supply of pulpwood, and in addition, accelerate the growth of such trees as are reserved for saw-timber production.

Significant data shown in Table 4 are presented graphically in Fig. 3.

Table 4. - Cordwood volume by tree diameters in species groups and forest type groups

Tree species groups	Tree diameter classes	Forest type groups classified by predominant species			Total all types	Percent of total volume
		Pine	Pine-hardwood	Hardwood		
		Thousands of cords[1]				
Pulping pine:[2]	6" - 8"[3]	2,121	1,214	41	3,376	11.4
	10" - 12"	2,400	1,325	71	3,796	12.9
	14" - 18"	1,356	779	46	2,181	7.4
	20" & over	314	328	35	677	2.3
Total pine		6,191	3,646	193	10,030	34.0
Pulping hardwood:[4]	6" - 8"	92	345	793	1,230	4.2
	10" - 12"	124	459	1,264	1,847	6.2
	14" - 18"	51	249	958	1,258	4.3
	20" & over	27	107	854	988	3.3
Total pulping hardwood		294	1,160	3,869	5,323	18.0
Total pulping species		6,485	4,806	4,062	15,353	52.0
Nonpulping hardwood:[5]	6" - 8"	356	1,143	2,164	3,663	12.4
	10" - 12"	304	1,703	3,524	5,531	18.8
	14" - 18"	119	736	1,915	2,770	9.4
	20" & over	66	454	1,653	2,173	7.4
Total nonpulping hardwood		845	4,036	9,256	14,137	48.0
Total all species		7,330	8,842	13,318	29,490	
Percent of total volume		24.8	30.0	45.2		100.0

[1] To convert to full number of cords add "000".

[2] Shortleaf and loblolly.

[3] Trees ranging from 5.0" to 8.9" in diameter outside of bark at breast height are placed in the 6" - 8" class; corresponding limits apply to the other diameter classes.

[4] Gum, cottonwood, willow, cypress, tupelo, maple.

[5] Oak, hickory, ash, hackberry, elm, pecan, etc.

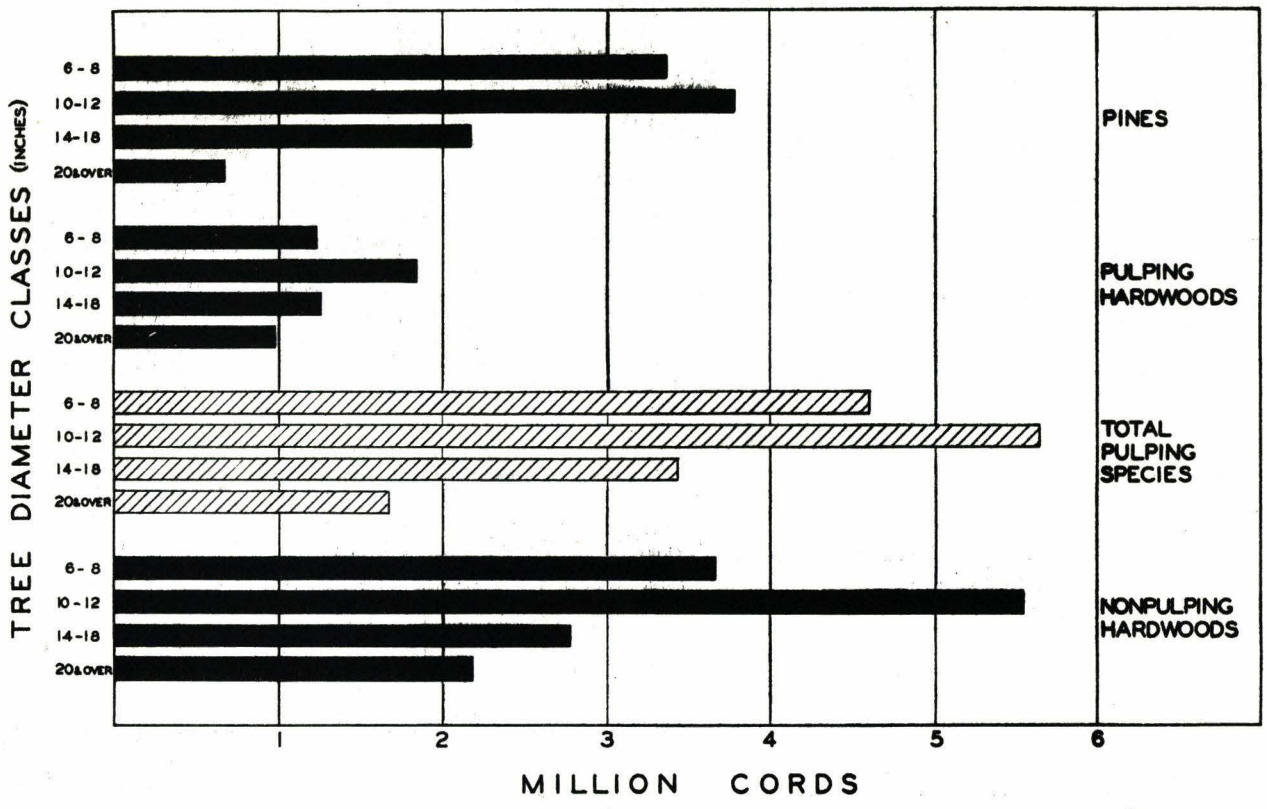

Figure 3. - Graph showing cordwood volume by species groups and tree diameter classes

Cordwood volume for the average acre is shown in Table 5 by species groups and tree diameter classes. The volume for the average acre is a theoretical figure derived by dividing the total number of cords of wood in each species group and tree diameter class by the total forest acreage. The average acre bears over 9½ cords of wood in all species; more than half this amount is in the pulping species. The stand of pine on the average acre is 3.25 cords, considering trees of all sizes regardless of the fact that they may be of a size and quality most suited for lumber production. More than 71 percent of this volume of pine cordwood, or 2.32 cords per acre, is in trees less than 13 inches in diameter. In the pulping hardwoods more than 58 percent of the volume, or 1.0 cord per acre, is in trees less than 13 inches in diameter.

The volume of pulpwood that can be cut from trees less than 13 inches in diameter without reducing the forest growing stock cannot be determined until calculations showing the timber growth rate have been completed. When growth data have been completely summarized, and the probable future needs of the lumber and other forest products industries have been determined, the industrial demand for wood will be balanced against the forest growth. By this means of comparison it will be possible to estimate accurately how much wood can be consumed annually without decreasing the forest capital. These estimates will be presented in the comprehensive report to be published later.

Table 5. - Cordwood volume on the average acre of forest land, classified by species groups and tree diameters [1]

Tree species groups	Tree diameter classes								Total all diameter classes	
	6" - 8" [2]		10" - 12"		14" - 18"		20" & over			
	Cords	% of total	Cords	% of total	Cords	% of total	Cords	% of total	Cords	% of total
Pulping pine [3]	1.09	11.4	1.23	12.9	.71	7.4	.22	2.3	3.25	34.0
Pulping hardwood [4]	.40	4.2	.60	6.2	.40	4.2	.32	3.4	1.72	18.0
Total pulping species	1.49	15.6	1.83	19.1	1.11	11.6	.54	5.7	4.97	52.0
Nonpulping hardwood [5]	1.19	12.5	1.79	18.8	.90	9.4	.70	7.3	4.58	48.0
Total all species	2.68	28.1	3.62	37.9	2.01	21.0	1.24	13.0	9.55	100.0

[1] The entire forest area of 3,089,100 acres was considered in finding the average acre.

[2] Trees ranging from 5.0" to 8.9" in diameter outside of bark at breast height are placed in the 6" - 8" class; corresponding limits apply to the other diameter classes.

[3] Shortleaf and loblolly.

[4] Gum, cottonwood, willow, cypress, tupelo, maple.

[5] Oak, hickory, ash, hackberry, elm, pecan, etc.

Summary

Approximately 38 percent, or 3,089,100 acres, of the 8,153,500 acres in Mississippi Survey Unit #2, is forest land. Ninety-six percent of the forest area is in second-growth stands; 55 percent is in the pure pine and mixed pine-hardwood types. The timber volume in the Unit in live, sound trees is estimated at more than 29 million cords, of which more than 15 million cords are in pulping species. Well-distributed roads and railroads make all parts of the Unit accessible. No figures for average growth are as yet available.